APPENDIX C

SUMMARY OF DISTRICT IC ENGINE RULES

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Note that this appendix contains summaries of the district rules. Please refer to the actual district rules for complete text.

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	Rule/Measure/Date
	Bay Area AQMD **Regulation 9, Rule 8** **01/20/1993**
Applicability	≥ 250 bhp; partly or completely gaseous fueled
Limits	CO – 2000 ppmv @ 15% oxygen **Natural gas fuels** ***Rich-burn*** NOx – 56 ppmv @ 15% oxygen ***Lean-burn*** NOx – 140 ppmv @ 15% oxygen **Waste-derived fuels** ***Rich-burn*** NOx – 210 ppmv @ 15% oxygen ***Lean-burn*** NOx – 140 ppmv @ 15% oxygen
Exemptions	■ Engines used solely as emergency standby sources of power ■ Engines < 250 bhp ■ Engines fired exclusively on liquid fuels ■ Engines used in agricultural operations ■ Engines ≤ 1000 bhp and < 200 hrs/year operation ■ Engines > 1000 bhp and < 100 hrs/year operation
Administrative Requirements	■ Maintain records of hours of operation for engines exempted due to low usage
Monitoring Period	Initial source test required by 3/31/97; results submitted by 5/31/97
Test Methods	NOx – ST-13 A or B CO – ST-6 VOC – ST-14

	Rule/Measure/Date
	El Dorado County APCD **Rule 233** **10/18/1994**
Applicability	> 50 bhp, operated on gaseous fuels, LPG, or diesel
Limits	CO – 2000 ppmv **Rich-Burn** NOx – 90 ppmv @ 15% oxygen **Lean-Burn** NOx – 150 ppmv @ 15% oxygen **Diesel** NOx – 600 ppmv @ 15% oxygen
Exemptions	■ Agricultural operations ■ ≤ 50 bhp engines ■ Engines operating < 200 hours per year ■ Emergency standby engines (maintenance limited to 50 hours/year) ■ Research and testing ■ Test stands used for evaluating engine performance ■ Diesel engines with permitted capacity < 15% ■ Diesel engines used to power cranes and welding equipment
Administrative Requirements	■ Maintain inspection log ■ Documentation supporting exemption ■ Annual emissions report
Monitoring Period	Annual source test
Test Methods	NOx – EPA Method 7E CO – EPA Method 10 O2 – EPA Method 3A

	Rule/Measure/Date
	Kern County APCD **Rule 427** **07/01/1999**
Applicability	≥ 50 bhp; all fuel types
Limits	**For engines > 50 bhp:** Follow required NOx minimization maintenance schedule **For engines > 250 bhp after 6/1/97:** CO – 2000 ppm **@** 15% oxygen **Rich-Burn** NOx – 50 ppm @ 15% oxygen or 90% reduction **Lean-Burn** NOx -- 125 ppm @ 15% oxygen or 80% reduction, or 2 gm/bhp-hr. if combustion modification used exclusively (125 ppm if no means to measure shaft power output) **Diesel** 600 ppm @ 15% oxygen or 30% reduction If engine efficiency exceeds 30%, ppm limits adjusted higher
Exemptions	■ Agricultural operations ■ Emergency standby engines operated < 200 hours per year ■ Engines used for fire fighting or flood control ■ Laboratory engines used in research and testing ■ Engines operated exclusively for performance verification and testing ■ Portable engines not operated at the same site for more than one year
Administrative Requirements	■ Emission control plan required ■ Engine service log ■ Engine operating log for engines subject to emission limits ■ Source test required every calendar year
Monitoring Period	For engines > 250 hp: For lean-burn and diesel engines, monitor NOx and CO concentrations, or if catalysts are used, monitor flow rate of reducing compounds or air to fuel ratio Source test annually or if Control Officer is provided with documentation related to NOx emissions showing the engine has been operating as when last tested and the Control Officer has no reason to suspect non-compliance: Every two years; or by testing after no more than 1000 hours of operation
Test Methods	NOx – EPA Method 7E or ARB Method 100 CO – EPA Method 10 or ARB Method 100 O2 – EPA Method 3 or 3A, or ARB Method 100

	Rule/Measure/Date
	Mojave Desert AQMD **Regulation 1160** **10/26/1994**
Applicability	≥ 500 bhp, located in Federal Ozone Nonattainment Area
Limits	CO – 4500 ppmv@ 15% oxygen **Rich-Burn** NOx – 50 ppmv @ 15% oxygen or 90% reduction **Lean-Burn** NOx – 140 ppmv @ 15% oxygen or 80% reduction **Diesel** NOx – 700 ppmv @ 15% oxygen or 30% reduction VOC –106 ppmv@ 15% oxygen, except 255 ppmv @ 15% oxygen at SCG Newberry Spring facility
Exemptions	■ < 500 bhp ■ Engines operating < 100 hours over four continuous calendar quarters ■ Emergency engines ■ Engines located outside of the Federal Ozone Nonattainment Area
Administrative Requirements	■ Emission control plan ■ Maintain log on each engine recording fuel use, maintenance performed, and other information required in Emission Control Plan
Monitoring Period	Engine inspection required once every calendar quarter or after every 2,000 hours of operation, whichever is more frequent Source test required every 12 months
Test Methods	NOx – EPA Method 7E CO – EPA Method 10 VOC – EPA Methods 18, 25, and/or 25A O2 – EPA Method 3A Exempt Compounds – ASTM Method D 4457-85

	Rule/Measure/Date
	Sacramento Metropolitan AQMD **Rule 412** **06/01/1995**
Applicability	≥ 50 bhp, located at major stationary sources
Limits	*RACT Emission Limits after 7/1/95:* **Rich-Burn** NOx – 50 ppmv @ 15% oxygen CO – 4000 ppmv @ 15% oxygen NMHC – 250 ppmv @ 15% oxygen **Lean-Burn** NOx – 125 ppmv @ 15% oxygen CO – 4000 ppmv @ 15% oxygen NMHC – 750 ppmv @ 15% oxygen **Diesel** NOx – 700 ppmv @ 15% oxygen CO – 4000 ppmv @ 15% oxygen NMHC – 750 ppmv @ 15% oxygen *NOx BARCT Emission Limits after 5/31/97:* **Rich-Burn** 25 ppmv @ 15% oxygen or 90% reduction **Lean-Burn** 65 ppmv @ 15% oxygen or 90% reduction **Diesel** 80 ppmv @ 15% oxygen or 90% reduction
Exemptions	■ Emergency standby ■ Agricultural operations ■ Test stands ■ Emission control evaluation ■ Non road engines ■ Motor vehicles ■ Flight line engines
Administrative Requirements	■ Operational record required
Monitoring Period	Source test required every 8,760 hours of operation or every 5 years, whichever is shorter
Test Methods	NMHC – EPA Method 25, or 25A and 18 **For spark-ignited engines:** NOx, CO, O2 – ARB Method 100 **For diesel engines:** NOx – EPA Method 7E CO – EPA Method 10 O2 – EPA Method 3A

	Rule/Measure/Date
	San Diego County APCD **Rule 69.4** **09/27/1994**
Applicability	≥ 50 bhp, located at major stationary source
Limits	CO – 4500 ppmv @ 15% oxygen NOx – 50 ppmv @ 15% oxygen or 90% reduction (rich-burn, all fuels except waste-derived) NOx – 125 ppmv @ 15% oxygen or 84% reduction (lean-burn, also rich-burn, waste-derived fuels) NOx – 700 ppm @ 15% oxygen or 25% reduction (diesel)
Exemptions	■ Used in connection with a structure for not more than four families ■ Agricultural operations ■ Engines operated for < 200 hours per year ■ Emergency standby engines operated ≤ 52 hours per year for maintenance ■ Emergency standby engines at nuclear generating stations operated ≤ 500 hours per year for maintenance ■ Military tactical deployable equipment operated ≤ 1000 hours per year
Administrative Requirements	■ Maintain maintenance records ■ Keep operating log for engines exempt due to low usage ■ Maintain monthly records for engine and control equipment parameters
Monitoring Period	None mentioned
Test Methods	ARB Method 100

	Rule/Measure/Date
	San Joaquin Valley Unified APCD **Rule 4701** **11/12/1998**
Applicability	Engine rated greater than 50 bhp and requiring a permit
Limits	CO – 2000 ppmv@ 15% oxygen *For engines not owned by the Public Water District:* **Rich-Burn except beam-balanced or crank-balanced pumping engines** NOx – 50 ppmv @ 15% oxygen or 90% reduction, VOC – 250 ppmv @ 15% oxygen **Lean-Burn** NOx – 75 ppmv @ 15% oxygen or 85% reduction, VOC – 750 ppmv @ 15% oxygen **Diesel or dual-fuel** NOx -- 80 ppmv @ 15% oxygen or 90% reduction, VOC – 750 ppmv @ 15% oxygen *For engines owned by the Public Water District:* **Rich-Burn except beam-balanced or crank-balanced pumping engines** NOx – 90 ppmv @ 15% oxygen or 80% reduction **Lean-Burn** NOx -- 150 ppmv @ 15% oxygen or 70% reduction **Diesel or dual-fuel** NOx – 600 ppmv @ 15% oxygen or 20% reduction *For beam-balanced or crank-balanced pumping engines:* NOx – 300 ppmv @ 15% oxygen *For waste-gas engines:* NOx -- 125 ppmv @ 15% oxygen or 80% reduction, VOC – 750 ppmv @ 15% oxygen
Exemptions	■ Agricultural operations ■ Standby engines ■ Engines used exclusively for fire fighting or flood control ■ Laboratory engines used in research and testing ■ Engines used for performance verification and testing ■ Gas turbines ■ Portable engines ■ Natural gas-fired engines, when using other fuels during a natural gas curtailment, if operated no more than 336 hours per year on the other fuel ■ Military tactical equipment ■ Transportable engines ■ Engines rated at 50 bhp or fewer
Administrative Requirements	■ Emissions Control Plan required ■ Maintain engine operating log
Monitoring Period	■ For engines with external control devices, CEMS for NOx, CO, and O2, or alternate monitoring system ■ For engines without external control devices, monitor operational characteristics as recommended by the manufacturer or emission control supplier ■ Source test required every 24 months ■ Annual testing of a representative sample of engines allowed for sites with multiple identical engines
Test Methods	NOx – EPA Method 7E or ARB Method 100 CO – EPA Method 10 or ARB Method 100 O2 – EPA Method 3 or 3A, or ARB Method 100 VOC – EPA Method 25 or 18, referenced as methane Bhp – Any method approved by the APCO and U.S. EPA

	Rule/Measure/Date
	San Luis Obispo County APCD **Rule 431** **11/13/1996**
Applicability	> 50 bhp
Limits	CO – 4500 ppmv @ 15% oxygen **Rich-Burn** NOx – 50 ppmv @ 15% oxygen or 90% reduction **Lean-Burn** NOx – 125 ppmv @ 15% oxygen or 80% reduction **Diesel** NOx -- 600 ppmv @ 15% oxygen or 30% reduction
Exemptions	■ Agricultural operations ■ ≤ 50 bhp engines ■ Engines operating < 200 hours per year ■ Emergency standby engines (maintenance limited to 50 hours per year) ■ Research and teaching ■ Test stands used for evaluating engine performance ■ Diesel engines used to power cranes and welding equipment
Administrative Requirements	■ Engine inspection plan required ■ Inspection log required
Monitoring Period	Every 8,760 hours of operation or 3 years, whichever occurs first
Test Methods	NOx – ARB Method 100 CO – ARB Method 100

	Rule/Measure/Date
	Santa Barbara County APCD **Rule 333** **04/17/1997**
Applicability	Engines ≥ 50 bhp and requiring a permit
Limits	**Noncyclic Rich-Burn Engines** NOx – 50 ppmv @ 15% oxygen or 90% control ROC – 250 ppmv @ 15% oxygen CO – 4500 ppmv @ 15% oxygen **Noncyclic Lean-Burn Engines:** NOx – 125 ppmv @ 15% oxygen or 80% control ROC – 250 ppmv @ 15% oxygen CO – 4500 ppmv @ 15% oxygen **Cyclically-Operated Engines:** NOx – 50 ppmv @ 15% oxygen or 90% control ROC – 250 ppmv @ 15% oxygen CO – 4500 ppmv @ 15% oxygen **Diesel Engines:** NOx – 8.4 g/bhp-hr. or 797 ppmv @ 15% oxygen
Exemptions	■ Engines operating on fuel consisting of 75% or more landfill gas ■ Engines exempt from permit ■ Engines operating fewer than 200 hours per year
Administrative Requirements	■ Quarterly inspections with portable NOx monitor and inspection of engine operating parameters ■ Bienniel source tests ■ Annual source tests for two consecutive years if engine is non-compliant ■ Engine operating log ■ Compliance plan ■ Engine inspection and maintenance plan
Monitoring Period	Every two years
Test Methods	NOx, CO, Oxygen – ARB Method 100 ROC – EPA Method 18 or 25 Fuel Composition – ASTM D-1945-81, ASTM D-3588-81, ASTM D-1072-80 Pollutant Emission Rate – EPA Method 19

	Rule/Measure/Date
	Shasta County AQMD **Rule 3.28** **04/01/1997**
Applicability	Any gaseous, diesel, or any other liquid-fueled stationary internal combustion engine within the borders of the District
Limits	*For engines > 50 bhp but ≤ 300 bhp:* CO – 4500 ppmv @ 15% oxygen **Rich-Burn** NOx – 640 ppmv @ 15% oxygen **Lean-Burn** NOx – 740 ppmv @ 15% oxygen **Diesel & all liquid-fired** NOx -- 600 ppmv @ 15% oxygen *For engines > 300 bhp:* CO – 4500 ppmv @ 15% oxygen **Rich-Burn** NOx – 90 ppmv @ 15% oxygen **Lean-Burn** 150 ppmv @ 15% oxygen **Diesel & all liquid-fueled** NOx – 600 ppmv @ 15% oxygen
Exemptions	■ Agricultural operations ■ Emergency standby engines operated < 200 hours/year ■ Any engine rated by the manufacturer ≤ 50 bhp if maintained to manufacturers specifications ■ Gas turbine engines ■ Engines operated exclusively for fire fighting or flood control ■ Laboratory engines operated in research and testing ■ Existing IC engines to be permanently replaced with electric motors or removed from service by July 1, 1999 based upon a permit condition, contract, or binding agreement with the District ■ Portable IC engines which have been registered and certified under the state portable equipment regulation ■ Diesel IC engines manufactured prior to 1950 and operated less than 500 hours per year
Administrative Requirements	■ Engine operating log for engines subject to emission limits
Monitoring Period	Annual source testing of emissions
Test Methods	NOx – EPA Method 7E or ARB Method 100, or a method approved in writing by the APCO using a portable analyzer CO – EPA Method 10 or ARB Method 100, or a method approved in writing by the APCO using a portable analyzer O2 – EPA Method 3 or 3A, or ARB Method 100, or a method approved in writing by the APCO using a portable analyzer

	Rule/Measure/Date
	South Coast AQMD **Rule 1110.1** **10/04/1985**
Applicability	> 50 bhp, stationary, gaseous fueled engines only
Limits	**Rich-Burn** NOx – 90% reduction, initial test, 80% reduction thereafter, or 90 ppm at 15% oxygen CO – 2000 ppm at 15% oxygen **Lean-Burn** NOx/General – 80% reduction, initial test, 70% reduction thereafter, or 150 ppm at 15% oxygen NOx/Optional (combustion mods only) – 2 grams per bhp-hr.
Exemptions	■ Agricultural operations ■ Emergency standby engines which operate fewer than 200 hours per year ■ Fire fighting and or flood control ■ LPG-fueled ■ Research and testing ■ Performance verification and testing ■ Engines operating in the Southeast Desert Air Basin portion of Los Angeles and Riverside Counties
Administrative Requirements	Control Plan
Monitoring Period	N/A
Test Methods	N/A

	Rule/Measure/Date
	South Coast AQMD **Rule 1110.2** **11/14/1997**
Applicability	> 50 bhp, stationary and portable engines
Limits	Permanently remove engine, replace engine with an electric motor, or reduce emissions to the following: **For stationary engines that generate electric power, are fired on landfill gas or sewage digester gas, are used for pumping water (except aeration facilities), are fueled by field gas, are integral engine compressors operating fewer than 4000 hours per year, or are LPG-fueled:** NOx – engines ≥ 500 bhp – 36 ppm @ 15% oxygen, engines > 50 and < 500 bhp – 45 ppm @ 15% oxygen VOC – 250 ppm @ 15% oxygen as methane CO – 2000 ppm @ 15% oxygen **For all other stationary engines:** NOx – 36 ppm @ 15% oxygen VOC – 250 ppm @ 15% oxygen as methane CO – 2000 ppm @ 15% oxygen **For portable engines:** Meet state limits equivalent to those in the State portable engine registration program
Exemptions	■ Agricultural operations ■ Emergency standby engines which operate fewer than 200 hours per year ■ Fire fighting and or flood control ■ Research and testing ■ Performance verification and testing ■ Engines locate in some parts of Riverside County ■ Auxiliary engines used to power engines or gas turbines during start up
Administrative Requirements	■ Engines > 1000 bhp and > 2 million bhp-hr. per year must use continuous emissions monitoring for NOx ■ Monitoring system shall have data gathering and retrieval capability ■ Operational and non-resettable totalizing time meter required ■ Source testing of NOx, VOC, and CO every 3 years ■ Maintain operating log
Monitoring Period	CEMS required for engines > 1000 bhp and > 2 million bhp-hr. per year Source test every three years
Test Methods	NOx – EPA Method 20 or District Method 100.1 CO – EPA Method 10 or District Method 100.1 VOC – EPA Method 25 or District Method 25.1

	Rule/Measure/Date
	Tehama County APCD **Rule 4.34** **06/03/1997**
Applicability	Any gaseous, diesel, or any other liquid-fueled stationary internal combustion engine within the borders of the District
Limits	*For engines > 50 bhp but ≤ 300 bhp:* CO – 4500 ppmv @ 15% oxygen **Rich-Burn** NOx – 640 ppmv @ 15% oxygen **Lean-Burn** NOx – 740 ppmv @ 15% oxygen **Diesel & all liquid-fired** NOx -- 600 ppmv @ 15% oxygen *For engines > 300 bhp:* CO – 4500 ppmv @ 15% oxygen **Rich-Burn** NOx – 90 ppmv @ 15% oxygen **Lean-Burn** 150 ppmv @ 15% oxygen **Diesel & all liquid-fueled** NOx – 600 ppmv @ 15% oxygen
Exemptions	■ Agricultural operations ■ Emergency standby engines operated < 200 hours/year ■ Any engine rated by the manufacturer ≤ 50 bhp if maintained to manufacturers specifications ■ Gas turbine engines ■ Engines operated exclusively for fire fighting or flood control ■ Laboratory engines operated in research and testing ■ Existing IC engines to be permanently replaced with electric motors or removed from service by July 1, 1999 based upon a permit condition, contract, or binding agreement with the District ■ Portable IC engines which have been registered and certified under the state portable equipment regulation ■ Diesel IC engines manufactured prior to 1950 and operated less than 500 hours per year
Administrative Requirements	■ Engine operating log for engines subject to emission limits
Monitoring Period	Annual source testing of emissions
Test Methods	NOx – EPA Method 7E or ARB Method 100, or a method approved in writing by the APCO using a portable analyzer CO – EPA Method 10 or ARB Method 100, or a method approved in writing by the APCO using a portable analyzer O2 – EPA Method 3 or 3A, or ARB Method 100, or a method approved in writing by the APCO using a portable analyzer

	Rule/Measure/Date
	Ventura County APCD **Rule 74.9** **12/21/1993**
Applicability	Gas-fired, LPG, or diesel-fueled stationary internal combustion engine ≥ 50 bhp, if such engines are not used in oil field drilling operations
Limits	CO – 4500 ppmv @ 15% oxygen Ammonia – 20 ppmv **Rich-Burn** NOx – 25 ppmv @ 15% oxygen or 96% control ROC – 250 ppmv @ 15% oxygen **Lean-Burn** NOx – 45 ppmv @ 15% oxygen or 94% control ROC – 750 ppmv @ 15% oxygen **Diesel** NOx – 80 ppmv @ 15% oxygen or 90% control ROC – 750 ppmv @ 15% oxygen **Rich-Burn, waste gas** NOx – 50 ppmv @ 15% oxygen ROC – 250 ppmv @ 15% oxygen **Lean-Burn, waste gas** NOx – 125 ppmv @ 15% oxygen ROC – 750 ppmv @ 15% oxygen
Exemptions	■ Engines rated less than 50 bhp ■ Engines operated less than 200 hours per year ■ Emergency standby engines operated only during emergencies and for no more than 50 hours per year for maintenance purposes ■ Engines used in research and teaching ■ Engine test stands used for evaluating engine performance ■ < 100 bhp emitting NOx ≤ 5 g/bhp-hr., used in cogeneration ■ Diesel engines limited to 15% or less annual capacity factor ■ Diesel engines used to power cranes and welding equipment
Administrative Requirements	■ Engine Operator Inspection Plan ■ Inspection log ■ Annual usage ■ Annual source test
Monitoring Period	Annual source test
Test Methods	NOx, CO, Oxygen – ARB Method 100 ROC – EPA Method 18 or 25, reference to methane Heating value of fuel oil – ASTM D240-87 Heating value of gaseous fuels – ASTM D1826-77 Ammonia – BAAQMD Method ST-1B

	Rule/Measure/Date
	Yolo-Solano AQMD **Rule 2.32** **08/10/1994**
Applicability	> 50 bhp, operated on gaseous fuels, LPG, or diesel
Limits	CO – 2000 ppmv @ 15% oxygen **5/31/95 limits:** NOx – 9.5 gm/bhp-hr. or 640 ppmv @ 15% oxygen (rich-burn), 10.1 gm/bhp-hr. or 740 ppmv @ 15% oxygen (lean-burn), 9.6 gm/bhp-hr. or 700 ppmv @ 15% oxygen (diesel) **If 5/31/95 limits not met, then following limits apply by 5/31/97:** NOx – 90 ppmv @ 15% oxygen (rich-burn), 150 ppmv @ 15% oxygen (lean-burn), 600 ppmv @ 15% oxygen (diesel) **If 5/31/95 and 5/31/97 limits not met, engine must be removed by 5/15/99**
Exemptions	■ Agricultural operations ■ ≤ 50 bhp engines ■ Engines operating < 200 hours per year ■ Emergency standby engines (maintenance limited to 50 hours/year) ■ Research and teaching ■ Test stands used for evaluating engine performance ■ Diesel engines with permitted capacity < 15% ■ Diesel engines used to power cranes and welding equipment
Administrative Requirements	■ Engine operator inspection plan required ■ Inspection log required
Monitoring Period	Annual source test
Test Methods	NOx – EPA Method 7E CO – EPA Method 10 O2 – EPA Method 3A Heating value of oil – ASTM Method D240-87 Heating value of gaseous fuel – ASTM Method D1826-77